Human Performance & Systems Integration Issues

LCDR Tom “Vegas” Jones

13 January 2015

Overview

- ***Identify the top Aeromedical issues associated with the Human Performance and Systems Integration.***
  - ***What is the number one Aeromedical issue concerning the Human Performance and Systems Integration today?***
  - ***How might we take care of the top Aeromedical issue sconcerning the Human Performance and Systems Integration today?***

CNAF Aeromedical Priorities

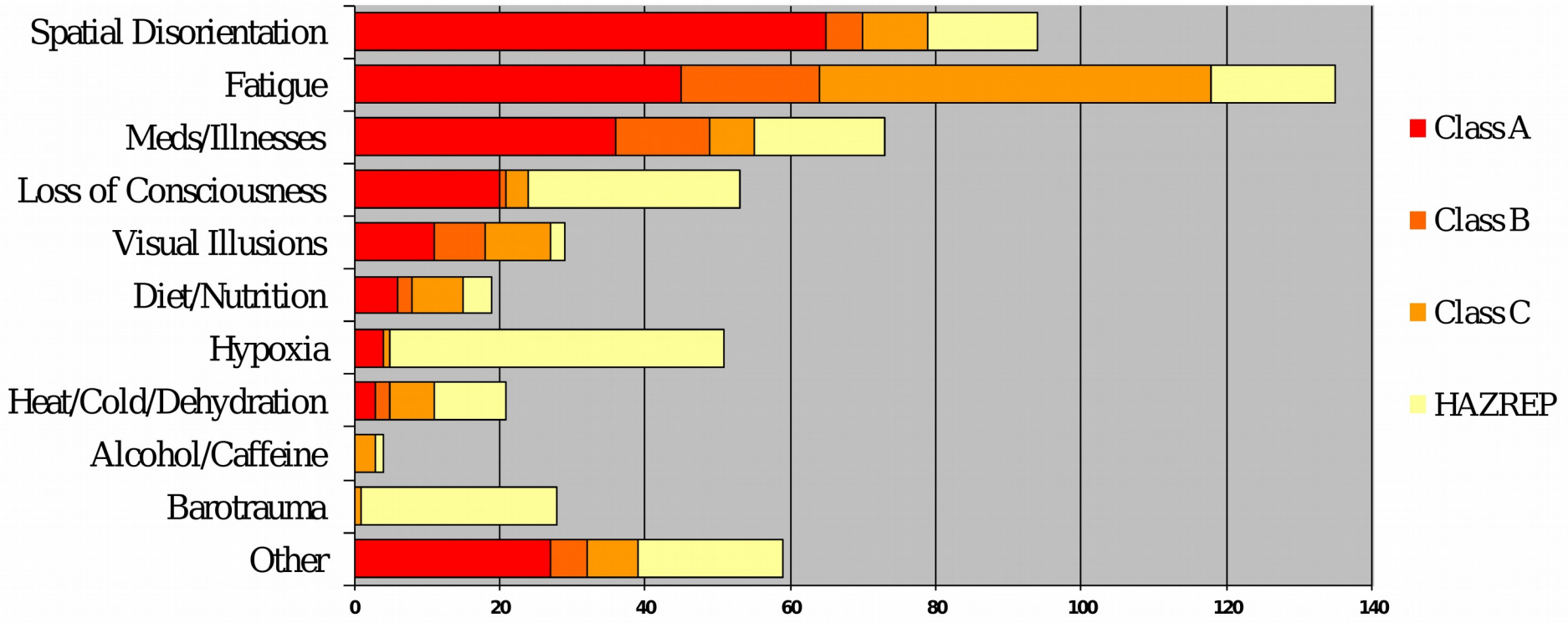
Top 5 Priorities

1) Spatial Disorientation & Controlled Flight into Terrain (CFIT) Avoidance
2) Fatigue Mitigation
3) Hypoxia & Decompression Sickness (DCS) Awareness
4) Whole Body Vibration Injuries, Neck & Back Pain Mitigation
5) G-Induced Loss of Consciousness (G-LOC) Prevention

TPP Top 5 – POM-15

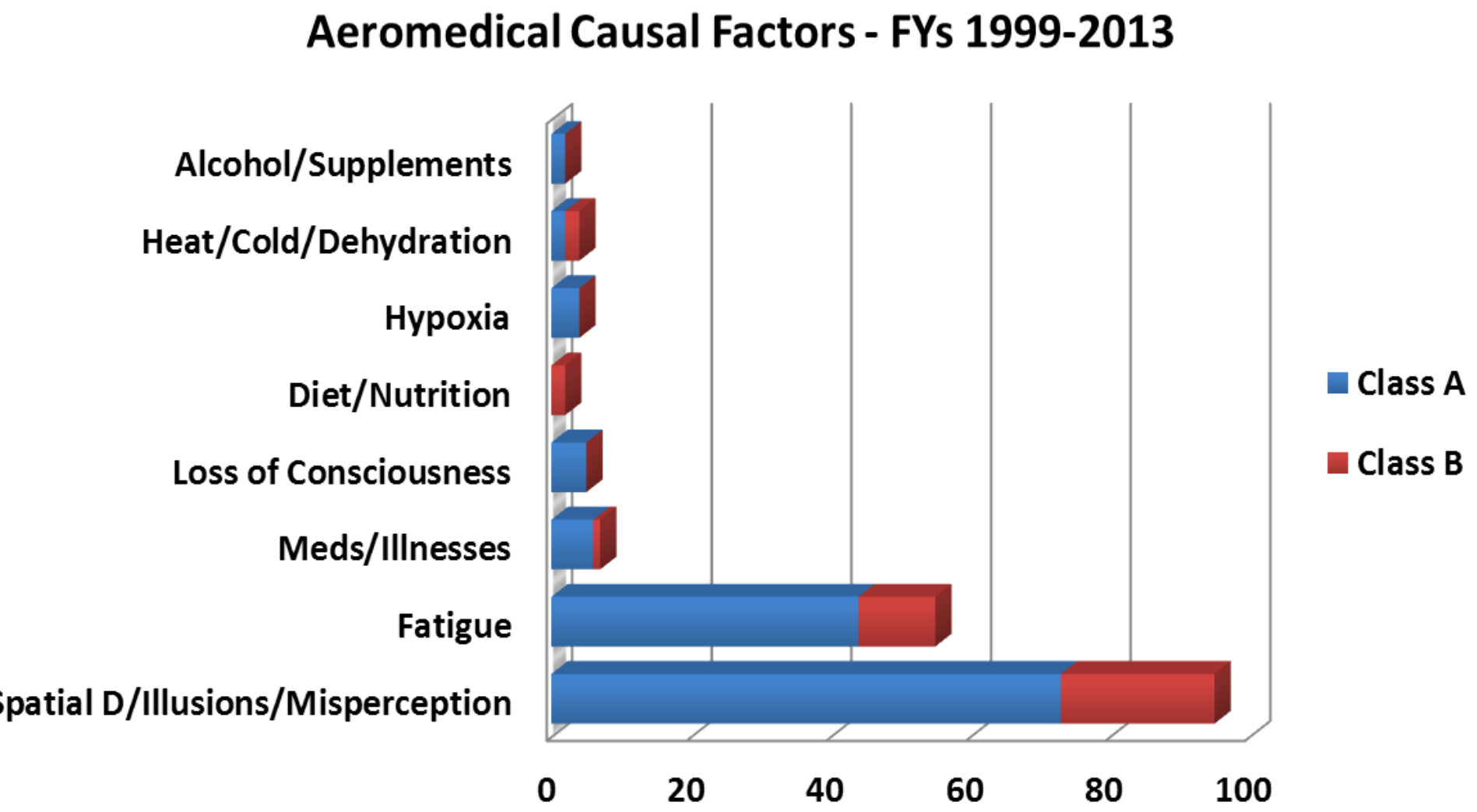
1) Human Systems Integration (Partially Funded)
2) Safety Technology Insertion (Not Funded)
3) Sensory Enhancement / Maint. (Not Funded)
4) Fatigue (Not funded)
5) Unmanned Aerial System Selection (Partially Funded)

Aeromedical Causal Factors Reported in Mishaps & HAZREPs

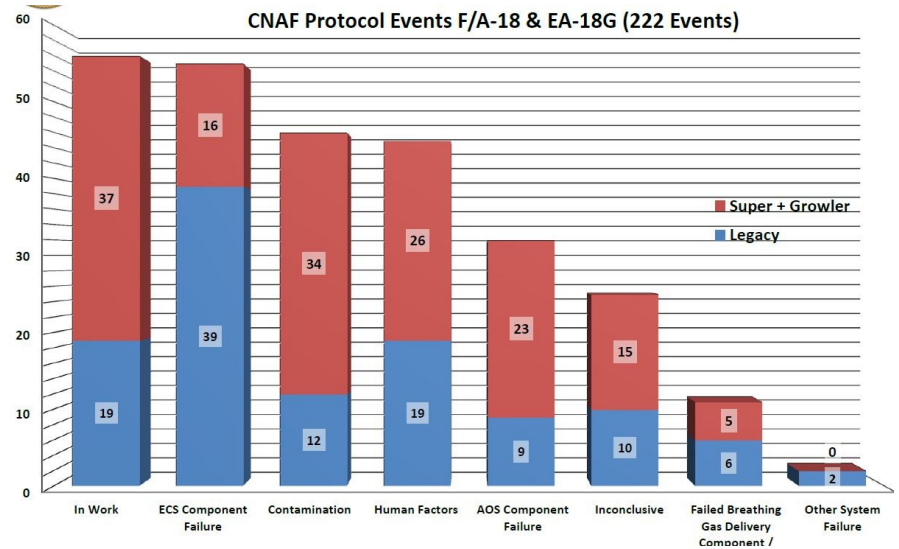


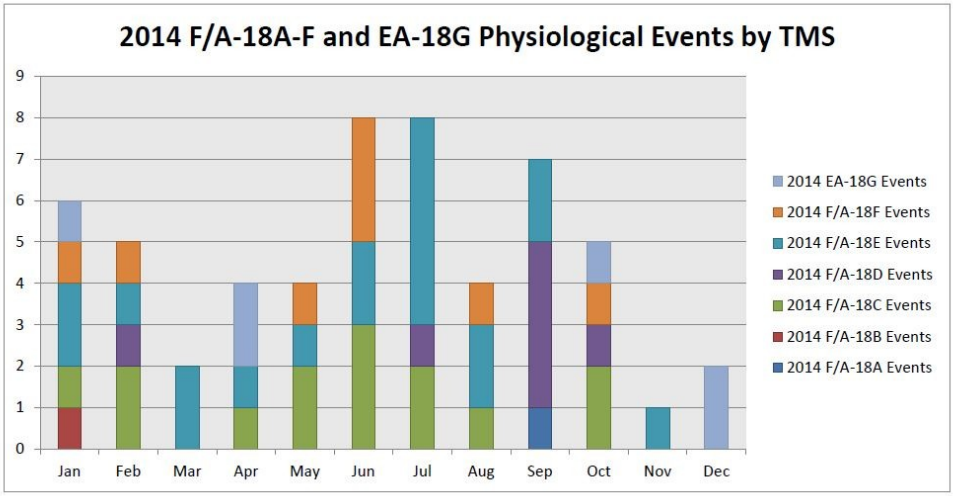
CAPT L. Mandel; NAVSAFECEN data from Mr. John Scott; FY's 1990-2011

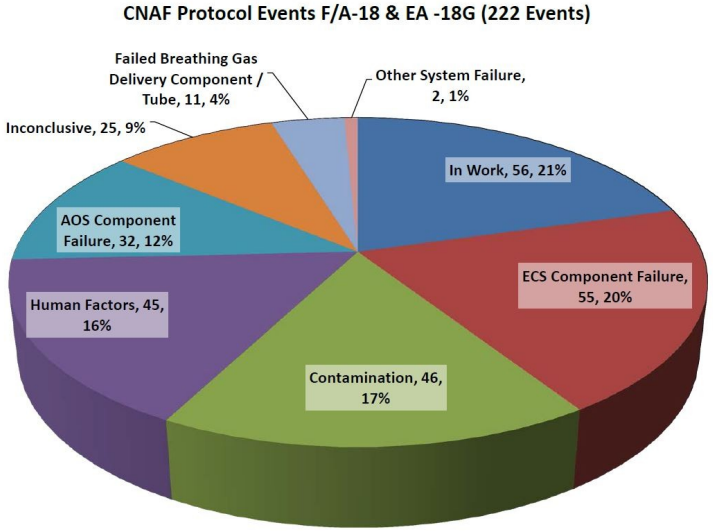
Mishap Causal Factors



Fleet Data (Hypoxia/DCS)






CNAF Protocol Events F/A-18 & EA -18G (222 Events)
Failed Breathing Gas Delivery Component / Tube, 11, 4%
Other System Failure, 2, 1%
Inconclusive, 25, 9%
In Work, 56, 21%
AOS Component Failure, 32, 12%
ECS Component Failure, 55, 20%
Human Factors, 45, 16%
Contamination, 46, 17%

TYCOM Support/Sister Service Efforts

FOUO

DEPARTMENT OF THE NAVY
COMMANDER NAVAL AIR FORCE, PACIFIC
BOX 357051
SAN DIEGO, CALIFORNIA 92135-7051

5400
Ser N00/1561
20 Nov 12

From: Commander, Naval Air Force, Pacific
To: Director, Air Warfare (OPNAV N98)

Subj: ENDORSEMENT FOR FUTURE NAVAL CAPABILITY FY13-17 PRODUCT, "HYPOXIA ALERT AND MITIGATION SYSTEM (HAMS)" UNDER THE ENABLING CAPABILITY, "FHP-FY13-03 EXTREME OPERATIONS"

Ref: (a) 2012 Aircrew Systems (ACS) ENARG Priority List
(b) POM-13 Platform NARG & OAG ACS
(c) Hypoxia—A Physiological Threat, Approach

DEPARTMENT OF THE NAVY
CHIEF OF NAVAL AIR TRAINING
250 LEXINGTON BLVD SUITE 102
CORPUS CHRISTI TX 78419-5041

5400
Ser 00/0588
24 Jun 13

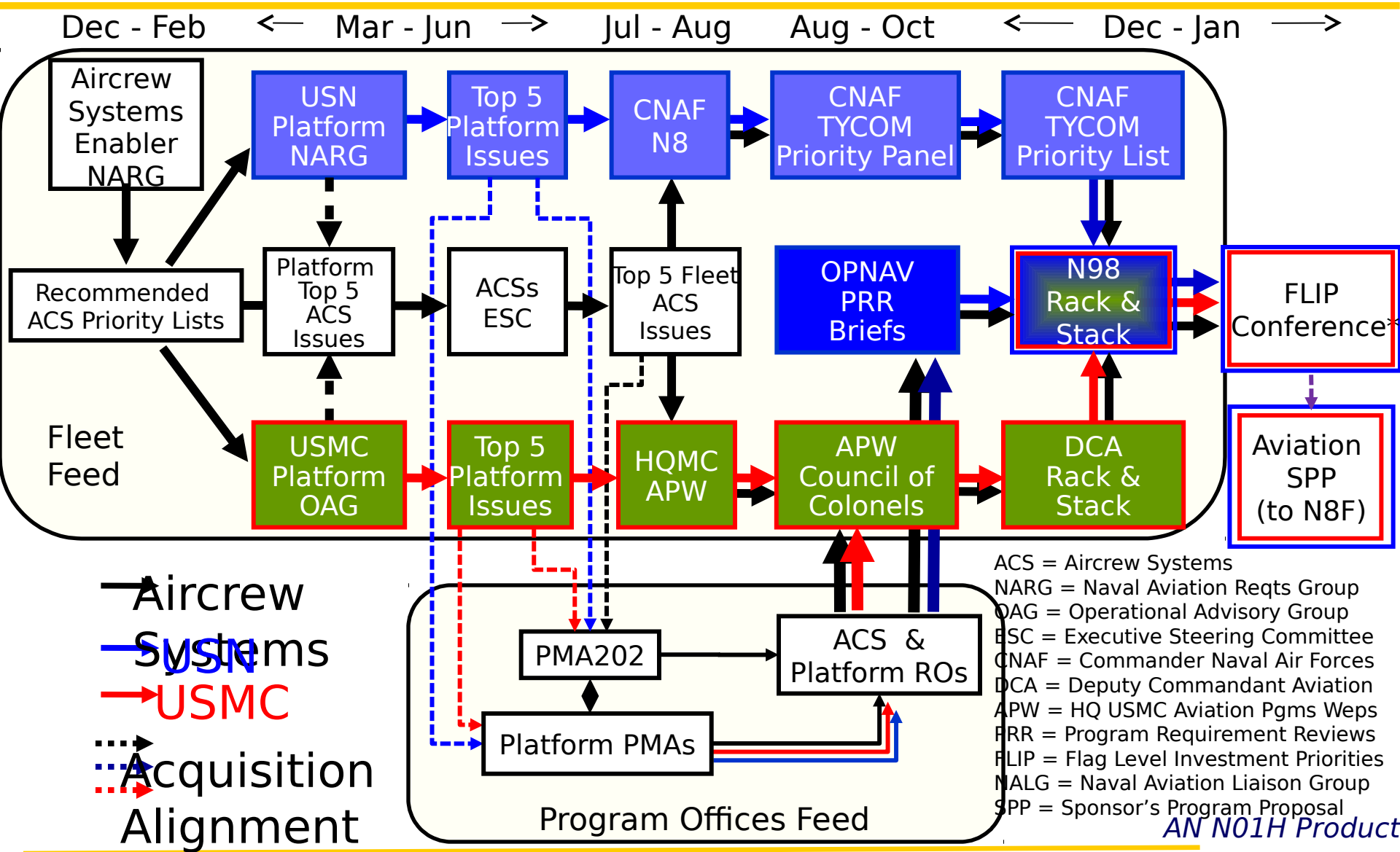
From: Chief of Naval Air Training
To: Chief of Naval Operations (N98)

Subj: ENDORSEMENT FOR FUTURE NAVAL CAPABILITY FY13-17 PRODUCT, AIRCREW MOUNTED PHYSIOLOGICAL MONITORING AND ALERT SYSTEM

Ref: (a) 2012 Aircrew Systems (ACS) ENARG Priority List
(b) POM-13 Platform NARG & OAG ACS
(c) Commander, Naval Air Force, Pacific HAMS Endorsement

1. Per reference (a), hypoxia mitigation is a top priority among Navy and Marine Corps aircrew. Reference (b) places

NARG Process



ACS E-NARG Priorities POM-17

CNAF Top Priorities:

1) Hypoxia Protection
2) Mission Endurance
3) Survival Radio Sustainment

COUNCIL OF COLONELS BRIEF

PRI	PROGRAM	FY-17	FY-18	FY-19	FY-20	FY-21	FYDP 17-21
1	Hypoxia Protection	1.6					1.6
2	Mission Endurance	1.0	1.0	1.0	1.0	1.0	5.0
3	Survival Radio Modernization & Sustainment	2.2	3.1	8.8	11.2	12.6	37.9

#1. Hypoxia Protection

Program Proposal / Description

- Implementation of a holistic solution across three realms:
  - Systems: T-45 concentrator improvements; leverage progress made with FA-18 concentrators.
  - Training: Reduced Oxygen Breathing Device trainers.
  - Physiological: pursuit of human performance monitoring solutions.

Resource Sponsor/Cost/Seams

- Resource Sponsors: N98
- Costs: (FY17 / FYDP)
  - Systems: $1.1M / $11.6M (CNATRA #10 issue)
  - Training: $.5M / (annual op & maint support)
  - Physiological: (continued S&T sources pursuit)
- Seams: None

Justification

- FA-18s are experiencing hypoxic episodes at all altitudes. 222 verified hypoxia/DCS events since 2000 (3 fatal).
- T-45s are experiencing episodes with increasing frequency (HAZREPS: FY11 = 5, FY12 = 19, FY13 = 31, FY14 = 32 as of 8Sep).

Impact if not funded: Continued risk of losses of aircraft and aircrew. Continued high frequency of mission degrading hypoxic-related events.

Supporting Documents/Analysis

- #2 ACS issue POM-16. #4 or #5 since POM-11.
- Platform priorities: #3 T-45. #1 F/A-18 SSWG issue.
- PMA265 Physiological Episodes Team working issue.

Objective Prioritization

Must Have / **Should Have** / **Nice to Have**

Critical safety issue- potential loss of aircraft / life

OPNAV N98 PRIORITIZED POM-17 ISSUE SUMMARY

		FYDP TOTAL	OVERHEAD FYDP	PB 15/BES 16 EQUITY	FLEET PRI	FEA/ WSCP
1	**Mission Endurance/Performance enhancements** ▪ Enables ACS team to evaluate and certify technology and capability improvements demonstrated by other Services and Industry	$5M	$4.5M	$5.3M	2	
2	**CSEL Survival Radio Sustainment Upgrade** ▪ Modern technology insertion to address performance deficiencies, improve operational effectiveness, and afford significant cost avoidances ($40M in FYDP, $80M by 2030).	$7.5M	$4.1M	$0.0M	3	
3	**Night Vision Cueing & Display Organic Depot Repair capability** ▪ Title 10 Core Capability compliance	$8.3M	$.4M	$0.0M	NA	

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HQMC APW-1/APP-1 Endorsement Letter (13Oct14): “HQMC Aviation department highly endorses investments that ensure our aircrew’s safety.”

Funding Results

- **TYCOM Priority List**
  - **POM 16**
    - **T-45 force retro-fit O2 Monitor CRU-123 (FY16 $3.2M, FYDP $13.9M)**
  - **POM 17**
    - **T-45 forced retro-fit Concentrator GGU-25 (FY-17$1.2M, FYDP $13.3M)**

Continuing Efforts

Hypoxia/DCS Mitigation

- In parallel with aircraft improvements

- Man-mounted Hypoxia Alert System
- Dynamic Hypoxia Training
  - Procure fleet hypoxia training devices
  - Support fleet refresher requirement
- Increased Aeromedical Manpower
  - Operational Physiologists at TW-1/TW-2
- NAE PET involvement

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Question

LCDR Tom "Vegas" Jones

Commander Naval Air Force, Pacific

Aeromedical Safety Officer

tom.jones1@navy.mil

619-545-1142